American Journal of Surgery and Gynecology.

VOLUME XVI. ST. LOUIS, MO., APRIL, 1903. NUMBER 9

RECUMBENCY IN THE TREATMENT OF POTT'S DISEASE.

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Recumbency as a method of treatment of Pott's disease dates back many years. As long ago as 1842 Sir Benjamin Brodie* said: "From the first moment in which the nature of the case is clearly indicated, the patient should abandon his usual habits and be confined to bed or couch." With the introduction of the plaster-of-paris jacket, however, recumbency was to a large extent, abandoned. It was claimed that this new method was preferable because it allowed the patient to have the benefit of fresh air and exercise which, of course, are of great importance in the management of a tubercular disease. It was soon demonstrated, however, that in many instances a rapid increase of deformity took place, in spite of the mechanical support, especially when applied for disease above the mid-dorsal region, showing conclusively that the support was inefficient.

While the plaster-of-paris jacket and other forms of mechanical support, when properly applied, will always have their place in the treatment of selected cases, there are certain limitations and defects that must be recognized. The fundamental principle in the treatment of a disease that is essentially a destructive bone inflammation, is the removal of the adverse factors of superincumbent weight and intervertebral pressure. It is obvious that no form of mechanical support yet devised is capable of doing this with absolute certainty, and it is by recumbency only, modified according to circumstances, that complete rest and removal of injurious pressure is secured.

The objections to the recumbency treatment have been greatly overestimated. It has been urged that by recumbency patients are deprived of sunlight, fresh air and exercise, and that in consequence of this they became more emaciated, more anemic and more irritable. It has been my experience that patients with tubercular joint disease, whether in the spine or elsewhere, not only do not suffer from the enforced confinement, but that all symptoms improve rapidly during the bed treatment, even when continued for a considerable length of time. In some cases, more particularly in the very acute ones, there seems to be no limit to the length of time that confinement to bed is endured and is of benefit. In other cases, however, there is a limit to the rest treatment and there are certain well defined indications that tell us when to modify or discontinue recumbency. As a rule it may be discontinued as soon as the patient is free from pain and becomes more restless and discontented and evinces a desire to sit up or get up. Nature seems to be the best guide in this matter, for so long as a child has pain and finds itself more comfortable in the recumbent posture it not only does not object to remaining there, but exhibits a great disinclination to get up or move about. This is also true of other measures that may be used in conjunction with the rest treatment.

In carrying out the recumbency treatment it is not sufficient simply to place the child in any kind of a bed. All essential details must be observed in order to get the best results. This means that the mattress must be a suitable one, a hard, flat one being preferable, as this prevents sagging of the body which would increase the intervertebral pressure at the point of disease. Undue turning and twisting of the body is also to be prevented by some form of fixation.

There is no method that is more certain to relieve the harmful intervertebral pressure than hyperextension of the spine. Various methods may be employed to accomplish this. A simple one is to place a firm pad or cylindrical cushion under the spine at the point of the kyphotic curve, the effect of which would be to unbend the flext vertebral column.

To avoid the supposed evil consequences of confinement in doors, a method may be adopted that will permit the child to be taken out of doors for fresh air and yet maintain recumbency and traction at all times. This is done by utilizing a bed frame, made of gas-pipe or wrought iron, of proper length and width, and covered with stout canvass or sail cloth. The child is placed upon this frame and kept there constantly. An upright, carrying a pulley, may easily be attacht to this frame or "stretcher splint" for making traction when desired. The frame may be modified by bending it at a suitable point in such a way as to make the upper surface convex in outline, so that when the child is placed upon it a considerable amount of hyperextension may be obtained.

Phelps has proposed and used what he called his "Stehbett," which is made by cutting a board somewhat the shape and size of the child. After this board is properly padded the child is placed in position and fixt to it by encircling it with plaster-of-paris bandages, extending from the upper part of the chest to the feet. Fixt up in this way, the child may readily be carried about, set up against a wall or placed in any desired position. The gas-pipe frame, however, is preferable as being more readily kept clean.

Traction seems necessary in many cases, in addition to the recumbency, for the purpose of overcoming reflex muscular spasm; and there is nothing that will relieve pain, due to or aggravated by such spasm, more thoroly and promptly than a properly adjusted weight and pulley. The relief in many cases is almost instantaneous.

When the disease is below the mid-dorsal region traction applied to the legs by means of the ordinary Buck's extension is the best adjuvant to the bed treatment. The utility of traction or extension in disease of the lumbar spine may be questioned, as there is a possibility of obliterating the normal antero-posterior curve, which would increase the pressure on the carious bone. It is desirable to maintain the normal curve by the prone or supine position.

SUMMARY.

The general principles of this treatment may be summarized as follows:

1. During the acute stage all cases should be put to bed and kept there so long as there is evidence of active bone inflammation, and this regardless of the region of the spine involved.
2. All patients who, when properly supported by mechanical appliance, easily tire when on their feet, or have a frequent desire to lie down, will improve more rapidly if put to bed.
3. Recumbency, either alone or combined with fixation and traction is especially indicated in severe caries involving the cervical and upper dorsal vertebrae.
4. Recumbency is of special value in cases where an abscess is about to form or where symptoms of paralysis are coming on; should these complications have occurred recovery will be more rapid and more thoro than when patients are allowed to be on their feet.
5. Recumbency with hyperextension of the spine and fixation is vastly more certain and reliable in promoting recovery than mechanical support alone; the duration of many cases may be materially shortened and deformity prevented by a certain period of recumbency at the proper time.
6. Experience alone can determine the length of time recumbency will be necessary and what class of cases are most benefited by it.

*Diseases of the Joints, page 266.

BOW LEGS AND KNOCK-KNEE.

BY DANIEL LAFERTE, M. D., DETROIT, MICH.,
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The question, "How do you treat bow-legs and knock-knee?" is so frequently askt me by general practitioners that it seems to me a sufficient reason to write a short illustrated article upon these subjects.

While it is not possible to treat all cases alike, yet the methods followed in the two cases about to be reported serve as a fair illustration of our method in the management of such cases at the Children's Free Hospital, where we have constantly cases of that nature under our care.

CASE I.—The first case, tho it appears mild, is nevertheless one of true unilateral genu valgum. When a line was drawn from the head if the femur to the internal malleolus, that line passt to the outside of the center of the knee-joint. The anterior surface of the femur lookt directly forward, the foot pointed forward instead of inward, and when the leg was fully extended the inner surface of the knee toucht the well knee, but the malleoli of the tibiae could not be made to come in contact. When the leg was fully flext upon the thigh the genu valgum disappeared.

Here, then, we had to deal with a condition consisting of elongation of the internal condyle of the femur, discust at so much length by Poore, causing the deformity. That being the case, the wearing of braces would be of little use.

In such a case it has been my experience that nothing short of an operation effects a cure. I have now and then succeeded in rectifying knock-knee with braces, but it has been in those cases where no elongation of the internal condyle of the femur existed.

In the case under consideration I performed MacEwen's operation, which consists in sawing thru the lower end of the

Fig. 1.—Jennie G.—Photograph, July 1902.

femur a little above the epiphyseal line. This section is made with an Adams's saw, the periosteum having first been raised from the bone by means of a narrow periosteum-elevator. This method I regard as much safer than using force by applying an osteoclast. Osteoclasis in the neighborhood of so important a joint as the knee is dangerous. After the bone had been sawed the limb was treated as an ordinary fracture: it was brought around into the straight position and a light plaster-of-paris bandage applied. This remained on for four weeks, which is about the average time that the limb is kept bandaged. I let my patients begin to walk if they will at the end of that time, but I find that most of them do not care to walk much until about the end of six weeks. The result in this case is shown in Fig. 2.

Fig. 1. Jennie G.—Photograph, January 1903.

CASE II.—If the term "bow-legs" is to be applied only to those cases in which the whole lower limb from the great trochanter to the malleolus presents a curve, then bow-legs in my experience (during my eighteen years' connection with the Children's Free Hospital) rarely exist. During all that time, with the many cases coming under my observation, I recall only one case where it was necessary to cut both femurs as well as the bones of both legs in order to rectify the deformity. It is true I have seen some cases where the femurs seemed slightly bent after the curve below the knee had been removed, but that curve was so slight as not to require interference. The pathological condition existing in the lower end of the femur, viz.: elongation of the internal condyle, seldom exists on the opposite side in genu varum.

The vast majority of the cases of bow-legs (which term may not be strictly correct) which I have been called upon to treat have been a bending of the tibia and fibula below the knee-joint, and the trouble could be traced to a present or pre-existing rachitic condition.

In subjects up to about the third year it is possible to straighten those limbs by means of braces worn for one or two years, provided there remains considerable softness in the bones.

Fig. 3. Eva P.—Photograph, July 1902.

If the rickets have been cured spontaneously or otherwise, the bones become as hard as ivory and braces can not overcome the curve and nothing short of an operation will suffice.

In the case represented in Fig. 3, the bones could be sprung back with the hand and braces could have remedied the difficulty, but the parents pleaded poverty and were unable to buy the necessary braces.

Fig. 4. Eva P.—Photograph six weeks after operation.

The child was given chloroform and with my hands I made a green-stick fracture of the bones in both legs, slightly over-

correcting the deformity. The limbs were put in a light plaster-of-paris bandage running from the toes to the junction of the upper with the middle third of the thigh.

The bandages were removed at the end of the fourth week, and the photograph was taken at the end of the sixth week, leaving the child in the condition shown in Fig. 4.

Commencing immediately after the operation I keep my patients (if they show any rachitic symptoms) on antirachitic remedies and follow up an antirachitic regimen. I may remark here that I always use my hands to break the bones whenever my strength is sufficient. When my hands can be used successfully I prefer them to an osteoclast, or a saw, or chisel and hammer.

THE CORRECTION OF CLUB FOOT.

BY STEWART LEROY McCURDY, PITTSBURG, PA.,
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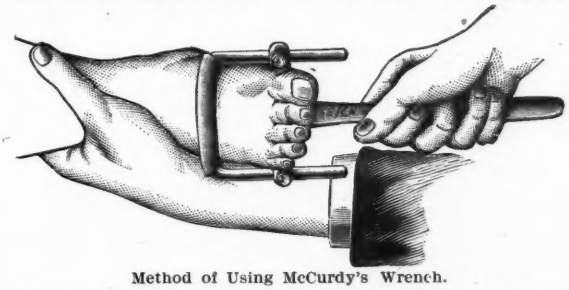
The correction of club foot depends upon, (1) severing of all tissues offering resistance to a supercorrection, and (2) upon a maintenance of the correction until reconstruction of the tissues have taken place. The principal part of the treatment is in maintaining the foot in a normal position during reconstruction. It is not a difficult matter to tenotonize resisting tissues and by forcibly breaking up ligaments that have formed during the deformed period; but it is most difficult to prevent a relapse.

I have never been able to effect a correction (or even to maintain a correction after operation) with a brace, and I have never seen such a result in the hands of others.

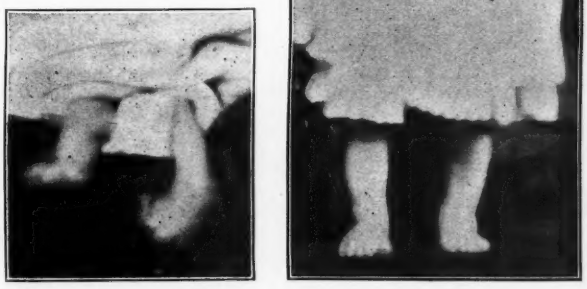
Author's Club-Foot Wrench.

The routine of treatment after many years of trials and failures, has resolved itself into, (1) making a correction. This means that all tissues must be cut that offer any resistance to

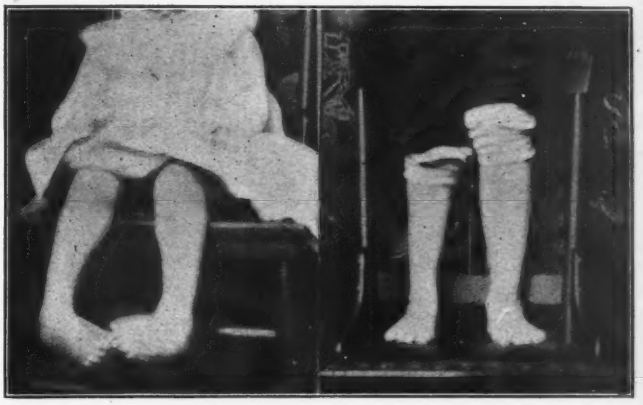


Method of Using McCurdy's Wrench.

correction, or better still, a supercorrection. After cutting the tendons and fascia, the foot is wrencht with sufficient force to tear loose all ligamentous attachments across articulations that offer resistance until the foot can be thrown in a deformity opposite to the original one. The rule formulated by the late lamented Phillips is to "First cut the tissue, offering the greatest resistance (usually the tendo Achilles) and continue to cut until a super-correction can be made."



Before Operation. After Operation.



Before Operation. After Operation.

The second step in the treatment is to maintain a correction for a sufficient length of time so that the foot stands alone in a normal position. This requires from three to six months.

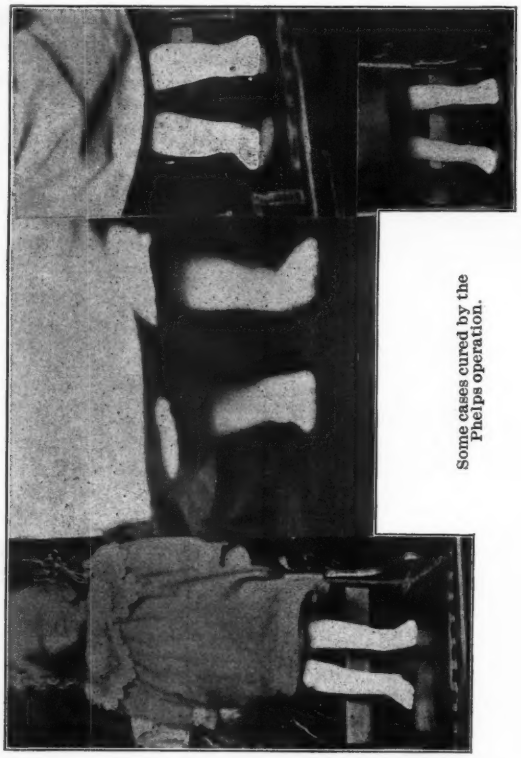
A favorable result.

A bad case—good result.

Before Operation. After Operation.

The means used to maintain a correction during reconstruction is plaster-of-paris. Immediately after the operation the

punctures made by the tenotome are dresst with small pieces of bichloride gauze. The entire foot and leg is envelopt with one thickness of cotton batting (not absorbent cotton), uniformly applied. The plaster-of-paris bandage is next applied directly to the cotton. Since the coarse cotton will not absorb the moisture from the bandages, it can be applied quite snugly with but little



Some cases cured by the Phelps operation.

fear of pressure necrosis. The foot should be held in the best possible position, by an assistant, while the bandage is being applied. The operator now moulds the plaster about the foot in the desired position to smooth out wrinkles, and holds it until the plaster hardens.

To my mind the secret of success is in the application of

A satisfactory result.

the plaster. To get that position which is best, three pressure points are necessary.

In equino-varus these points are:

1. Upward and outward against the ball of the great toe.
2. Downward and inward against the side of the foot in front of the external maleolus.
3. Outward and forward against the upper calf muscles on the inside of the leg. The foot must be flext to less than a right angle, or it will turn in the plaster.

The outside of the foot should be higher than the inside if this is possible.

The plaster bandages should be reapplied whenever they wear out, or whenever they fail to maintain the correction, or when for other reasons this may be demanded. The first dressing should be removed in about one month. I have never had suppuration following a tenotomy, and the wound has always healed in the first plaster without attention. Subsequent plasters are required about every month, depending entirely upon the age of the child, and whether it walks or not.

When plasters are properly applied, patients begin to walk after a few days, and thereafter nothing usually interferes with their going about all they may desire.

POINTS IN EARLY DIAGNOSIS OF TUBERCULOSIS OF BONES AND JOINTS IN CHILDREN.

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The great importance of an early diagnosis in tuberculosis of bones and points cannot be too forcibly impresst. By instituting the correct treatment before destruction of bone has taken place we can, in the majority of cases, save life and limb and prevent deformity and impaired function.

It is a sad fact that, especially in children where the subjective symptoms are more or less unreliable and the objective signs difficult to obtain on account of the unmanageableness of most children when first brought to the doctor, the busy practitioner often overlooks the early signs of tubercular bone and joint disease. This state of affairs is easily understood and even excusable when we consider the unfavorable conditions under which the general practitioner labors.

He is usually required to make a diagnosis and prescribe in one sitting, and often by interrogation only. Experience teaches the busy doctor that, in a child, a little fever, cough, and pain in the chest means a "cold," and a little fever, restlessness and irritability, and bellyache, means teething disease, gastro-intestinal disturbances or worms in the great majority of cases, which are easily relieved by the routine remedies. Can one then wonder that he does not always have a graver underlying condition in mind?

I would like to see the general practitioner that would try to thoroly investigate this class of cases in his every-day examinations! He would soon be paid by losing his clientage and by being the laughing stock of the community: "Just think, Mary had a cold, and Dr. X called twice a day and examined her!" He simply cannot do it; so it becomes necessary to learn to discriminate, but in so doing to always be on the guard for any suspicious evidence of the dread disease: tuberculosis.

Daily afternoon fever should be regarded as a suspicious evidence of tuberculosis and where there is no apparent lung or gland involvement, bone tuberculosis should be suspected; also the pain should be carefully analyzed, because we know that pain in front and sides of chest, stomachache, pain in the inguinal region, loins and buttocks, front or back of legs to knees, are symptoms found in Potts' disease in different regions of the spine; and that spasms of pain when the child is lifted under its arms indicates lesion of the middle region; while painful cramps in the legs may mean tubercular disease in the lower region of the spine; also is pain during the night considered an important symptom in tubercular bone disease, it is evidenced by the "night cry," moaning, grinding of teeth, restlessness and horrible dreams. Even the cough may be of bone origin, as in Potts' disease of the upper region we often have a cough, irritative and aimless in character, and the respiration may be labored and grunting, due to muscular spasms or voluntary restraint when the seat of the lesion is in the middle region. Spasmodic attacks resembling asthma are not an uncommon symptom in upper region Pott's disease. So we see that the pain in our little patient is not always "Lungpain," "Gutpain" or "Wormpain," the cough not always "Cold cough," and the restlessness and irritability not always "teething disease" or "growing pains."

Have we then before us with fair certainty a daily-afternoon-fever case and we are not absolutely sure of the cause of the pain, we are not alone justified in, but it becomes our duty to begin, a systematic and rigid examination and not give up until we are certain of the diagnosis.

First the mother should be carefully scrutinized and ques-

tioned as to the present physical condition as well as before and at the time the child was born, her social conditions and environments should be closely observed, because, altho tuberculosis cannot be transmitted in utero we may have inherited predisposition to the disease due to parental weakness and low vitality caused by disease, malnutrition, poor hygiene and overwork, and if it be tuberculosis in the parent which is the cause of inherited predisposition in the child, it is but reasonable to suppose that the bacteria from the parent would find a favorable soil in the offspring, lessened in its fighting capacity against disease.

On the other hand the predisposition may be acquired and it therefore becomes necessary to inquire into the personal history of the child, its previous diseases, as nasopharyngeal or bronchial catarrh, whooping cough, rachitis, its nourishment, growth and development.

It has been proven that the bacilli of tuberculosis may find their way into the blood current and set up primary disease in bones and joints when there is local lowered resistance. This may be induced by injury especially to young, growing bone. The injury need not necessarily be severe in character because even slight injury may cause hemorrhage into the substance of the cancellous tissue of bone followed by local congestion, and a more favorable soil for the growth and rapid multiplication of the germ could hardly be found. Therefore is it of the greatest importance to ascertain if such injury has taken place, for instance by falling from the bed or baby carriage. Having acquainted ourselves with the history in detail, it is essential to see the child in the forenoon and afternoon for several days in order to take the temperature and gain the good will of the little patient, because without this last the examination for objective signs is practically without avail. The clothing should be removed and each examination not occupy much time or the little one may become annoyed or tired.

Limitation of motion is the cardinal symptom, and the examinations are carried on with a view to ascertain its presence and exact location. There are, so to speak, two kinds of limitation of motion: voluntary, due to the pain caused by certain movements, and involuntary, brought about by muscular rigidity, which may either be a splint applied by nature in order to keep the inflammatory focus at rest or caused by nerve-reflex. Involuntary limitation of motion is by far the most important, because it appears earlier than any other symptom, is always reliable and indicates the location of the tubercular lesion. Rigidity of muscles and voluntary restraint alters the gait and changes the attitude, and may even cause asymmetry of the body-lines by continued muscular contraction. The gait may be limping, the patient being careful not to bear the weight of the body on the affected limb any more or longer than absolutely necessary, or if the focus is in the hip the affected side will be thrown over, as it were, by a rotary movement of the pelvis. If the disease is located in the lower region of the spine, the gait will be of a characteristic short step, tiptoed, careful variety—usually limping, in the effort to keep the spine as rigid and motionless as possible.

The change in attitude is shown in standing, when a limb is affected by letting the weight of the body fall upon the healthy side. When the seat of the disease is in the lower region of the spine the pressure from weight of the upper part of the body upon the bodies of the vertebra will be diminisht by bending the trunk backward (the so-called over-erect attitude) and if in the cervical region the favorite attitude is with the head supported by the hands in some way. In the sitting posture, if the spine is affected in some part of its lower two-thirds, the patient will relieve pressure by supporting the trunk with a hand on each side of the chair, and if in the hip the patient will prefer to sit sideways on the edge of the chair with the affected limb straight out.

Asymmetry of body lines is not prominent in the early stage of tubercular bone disease; usually it is limited to slight muscular fullness and elasticity on the affected side. But it is the test for limitation of motion on which we finally must rely. As a full description of these tests does not lie within the scope of this paper, I shall limit myself to a short account of a few which are easy to make and have proven themselves to be of the greatest service, not alone in determining the presence of limitation of motion, but also in pointing out the location of the lesion.

1—If the lower region of the spine is affected the patient will invariably pick up objects, coin, apple, from the floor sideways, or drop on his knees and regain the erect posture by the aid of his hands in some way.

2—Upon placing the patient face downward, lifting the legs with one hand and swaying the body from side to side carefully, fixing the thorax with the other hand, rigidity of the lower spine is easily noticed.

3—Placing the patient on his hands and knees, the "all-four position," and lifting him with the hands under his abdomen. If rigidity is present the spine retains almost its original contour.

4—Placing the patient face downward, pressing the pelvis firmly against the table with one hand and gently lifting the leg with the other, contraction or rigidity of the hip muscles (psoas contraction) can easily be felt.

5—When the patient is placed on his back with the buttocks close to the edge of the table, and the legs allowed to hang down, the healthy limb will drop below the diseased.

I have not yet spoken of tenderness, because, as pain, it is usually unreliable in the diagnosis of early tubercular bone disease. Still, if it can be located with certainty it is a most valuable aid in determining the seat of the lesion. It should therefore always be lookt for by pressing the processes of the vertebra, the head of the humerus, or wherever the disease is suspected to be located, and where there is diffused, circumscribed tenderness; the maximum intensity corresponds to the tubercular focus.

ILLUSTRATIVE CASE.

Let the following typical case serve as an illustration of the points I have endeavored to bring out:

Female child about 2 years old. Family came from Europe about 4 months ago, at which time the child suffered from whooping cough. Has not been feeling well since, has had fever, been restless in her sleep and her appetite failed. Sought the advice of two physicians within the last two months without relief, one said it was a "cold," the other did not give his opinion.

FAMILY HISTORY: Mother's brother has pulmonary tuberculosis. He stayed with the family until shortly before the baby was born. Mother has been and is apparently healthy; belongs to middle class; quite intelligent.

PERSONAL HISTORY: Labor normal and easy, nurst the mother the first year, has been well until whooping cough appeared, had a fall when on board steamer and rolled quite a distance on the deck, but as the baby soon stopt crying, the mother paid no more attention to it and had almost forgotten the incident.

PRESENT CONDITION: Fairly well nourisht, but somewhat sickly looking, very irritable and restless; wakes up nights and cries. Appetite poor as a rule, bowels sluggish, sometimes a little cough, cheeks hot every afternoon. (Now at 3 P. M. temperature is 102.5).

While questioning the mother the child was playing at her feet with an apple, and I noticed that when she tried to get up the left leg would, so to speak, drag after the right. This was done several times, always with the same result. The mother said that her baby had become so awkward of late, did not walk as good as before, and stumbled easily.

Examination showed a perceptible limp, and she pickt up a nickel from the floor in the manner characteristic of lower spine rigidity.

I called at the home forenoon and afternoon the next six days and found the afternoon temperature ranging from 101 to 103 and forenoon temperature usually slightly subnormal. The temperature on the following four afternoons ranged between 102 and 103.

During this time I had become acquainted with my little patient and by applying the tests had made a diagnosis of tuberculosis in the dorso-lumbar region of the spine, which no power in the world could rock. There was tenderness by pressing the spinous process of the first lumbar vertebra.

On the tenth day from the visit to my office a plaster jacket was applied and already on the fifth afternoon the temperature was normal and remained so. After that the patient slept well and ate well and soon enjoyed good general health.

In addition to the support the treatment consisted of outdoor life, nourishment, easily digestible food and syrup iodide of iron. When the jacket was removed about four months later limitation of motion had completely disappeared.

CONCLUSIONS.

1—A continuous afternoon fever in a child should strongly suggest tuberculosis and when this symptom is present careful and repeated examination should be made.

2—Limitation of motion is the cardinal sign on which a diagnosis of tubercular bone and joint disease should be based.

3—Pain and tenderness are more or less unreliable and serve only as a frame around the clinical picture of early tubercular bone and joint disease in the child.

THE "ALL-OPERATIVE TREATMENT" OF CONGENITAL CLUB FOOT.*

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There is a method of treatment of congenital club foot, still largely employed by surgeons, which is commonly called "operative treatment," to which reference is frequently made in this paper, in criticism of the plan. The operative features of this are of such minor importance as scarcely entitle it to merit the name "operative treatment." Its success is so largely dependent on the subsequent use of mechanical devices to correct the malposition of the foot, that the mechanical factor in the plan overshadows the operative, and the treatment of club foot by this method becomes essentially mechanical in character. In accordance with the title of this paper, the treatment of club foot is dealt with in this connection as a purely operative method—eliminating from the post-operative care the employment of correcting appliances, such as are commonly worn by the patient during the long period of time generally consumed in effecting a restoration of the foot.

It is not uncommon that club foot of the resistant variety is

Fig. 1. Severe, resistant club-foot at birth. Photograph made when infant was three weeks old.

present when the child is born, (Fig. 1) but this is so infrequent compared with the mild degree of deformity usually seen at birth, that it stands in no important relation to the large proportion of severe forms that come to the hands of the surgeon for operation. The history of these severe cases often indicates a mild grade of deformity in early infancy—the greatest relative increase occurring prior to the age when the child began to walk. (Fig. 2) In the majority of these patients, inquiry shows that during the infantile age, some efforts had been made to correct the malposition by tenotomy, forcible stretching, and the use of mechanical devices. The amount of deformity present in these severe forms at the time of later operative treatment does not, therefore, represent conditions of entire neglect; and yet the difference is not great between the case which has been totally neglected and that in which there has been relapse of deformity from faulty treatment. The opportunity frequently occurs in cases where treatment has been postponed, to observe the rapid increase of the distortion during the first year, whereby a mild degree of deviation of the foot becomes converted into an

*Read before the Surgical Section of the Buffalo Academy of Medicine, January 6th, 1903

Fig. 2. Resistant, severe, congenital club-foot, seventh month after birth. Deformity at birth was of mild degree. No treatment had been adopted.

unyielding malposition maintained by contracted muscles, fasciae and ligaments; and resistant, apparently out of all proportion to the conditions of force, growth and time which have been at work. Appreciating how potent for evil these agencies may be on the unrestrained position of the congenitally deflected foot during this period of rapid growth, we can better understand the reason of frequent failure to cure the deformity by the use of methods which, at best, do not adequately fulfill the indications of treatment.

The rapid development of the lower limbs, in anticipation of performing locomotion, the complex arrangement of muscles converging at the pedal extremity, the energetic movements which occur in those parts before they are required to sustain the weight of the body, and the soft, almost cartilaginous structure of the tarsal bones—these soon place the foot at enormous

Fig. 3. Relapst, congenital club-foot. Appearance at 14th month. Treatment began at 5th month by tenotomy, forcible manual stretching and plaster of Paris retention dressing. Manual stretching and retention appliances were in use at time photograph was made.

disadvantage as to its position and movements as soon as its muscular balance has been even slightly disturbed. The controlling muscles quickly adjust themselves to the yielding posture of the foot, becoming tense and shortened, while their opponents suffer depreciation of strength from disuse. Fascial coverings and their prolongations into the muscles undergo corresponding

contraction, and the strong ligaments of the tarsal arch become adapted to its now narrowed form. The entire structure of the foot, drawn-in upon itself by this combination of forces, is in a condition which no simple method of treatment or mechanical device could reasonably be expected to overcome.

Taking account of the deforming agencies that are constantly active, and the difficulty of successfully opposing them by some of the methods of treatment commonly used, it would appear that the teaching upon this subject is responsible for many of the short-comings of treatment, especially as it is employed during the infantile period. Infantile club foot is generally presented to the student and practitioner as a matter of simplicity and ease of treatment, provided the methods recommended are applied soon after birth. These consist mainly of subcutaneous division of contracted tendons and fasciae, forcible stretching of the plantar tissues and tarsal ligaments, and subsequent fixation of the over-corrected foot by plaster-of-paris bandages, or other retentive appliances. Repetition of the stretching and redressment is done until a satisfactory amount of correction has been secured. The retention dressing is later changed for a brace of one kind or another, which permits of massage, passive movement, etc., until the child is old enough to walk—some form of mechanical apparatus being worn for one or more years before the foot is considered safe from a relapse of the deformity.

Failure quite as frequently as success attends this method of treatment. When the time arrives for the child to walk, the foot is not, as a rule, in the position nor of the required shape to perform good locomotion; the muscles of the leg and foot are weak and undevelopt, from the long restraint they have undergone. It is not overstating the facts to say that eighty per cent. of patients so treated, whose deformities were of a degree requiring tenotomies in the early months of infancy, still have at the end of the second year of treatment varus malposition, for the correction of which further division or severe stretching of the plantar tissues is necessary. As one case differs from another in the severity of the primary conditions, the age when treatment was begun, and the quality of care which it had received, the varus at this stage may have dimensions ranging from a few degrees of adduction to extreme inversion and supination of the foot.

Criticism of the operative procedures briefly outlined may be directed especially to the management of the varus. The equinus factor is adequately overcome by the division of the Achilles tendon. The resistance to the correction of the varus element, lying in the long flexors, adductors, and the plantar tissues on the other hand, is very feebly met. For its relief there is rarely performed a division, even subcutaneously, of the tibials, the plantar fascia, or the superficial plantar muscles, and almost never of the plantar ligaments. The plantar tissues proper, whose origins and insertions are wholly within the anatomical limits of the foot, (which probably contribute in a greater degree than do the higher muscles to the maintenance of the varus) are treated usually to a severe manual stretching for the purpose of elongating them sufficiently to abduct the anterior portion of the foot. The occasional repetition of this manoeuvre is regarded as sufficient for removing the contraction in this region.

For the purpose of comparison, contrast with the foregoing what we find to be the conditions of resistance in those tissues when making the open plantar division, commonly known by the author's name, "Phelps's operation for the club foot." Resistance is encountered from the plantar integument thru the entire mass of tissue, fascia, muscles, tendons and ligaments, until reaching the under surface of the tarsal arch. Not infrequently the tarsal articulations must also be opened and the bones separated before the distortion can be corrected.

Apparently there is a misapprehension as to the functional value of these tissues, in this connection, that such reluctance is shown regarding their free division with the knife. Except in the very severe forms of club foot, the tendons of the long flexors, which lie high under the tarsal arch, oppose but slightly the correction of posture after the fascia, superficial plantar muscles and ligaments have been divided. Shortening, which may remain in the tibials and other long tendons after this has been done, may be removed by splitting and elongating them without completely severing them. Abduction of the foot to the desired amount may then be easily accomplisht and easily maintained. By this procedure there is no loss of functional power in the foot worth considering in comparison with the advantages of its quick restoration of posture. The altered shape of the tarsal bones renders a large amount of over-correction necessary. Even with the free division of the restraining plantar tissues, the tarsal bones tend easily to slip back into their faulty relations. The effort to secure the same degree of correction of the deformed foot by forcibly stretching these tissues even when the stretching is preceded by subcutaneous tenotomies can only be accomplisht by tearing them, with no accurate knowledge of what is being torn. Resort to this procedure would appear to be prompted by apprehension of some imagined danger from their accurate division with the knife, the existence of which has never been shown by experience. By comparison with the open plantar operation, forcible stretching is clumsy, inaccurate and unreliable, and offers no guaranty of permanence of the correction. The violence done to the tissues provides at once the material for cicatricial contraction, and, when the foot is free from mechanical restraint, the muscles again resume their deleterious action, as soon as they have recovered. It seems necessary to wholly eliminate the influence which the plantar muscles exert in maintaining the varus, and to restore a balance in the action of the muscles of the leg which are concerned more especially in holding the foot in the axis of weight.

The argument will no doubt be advanced in opposition to this criticism, that other conditions are present which contribute to the frequent failure of the method criticised, e. g., the delay in beginning treatment; the want of intelligent co-operation of parents; the length of time which the treatment must be continued, etc. A hundred reasons equally as good could be given for abandoning the method, e. g., the frequency with which stretchings must be repeated, and their painfulness unless done under anesthesia; the difficulty of adjustment of appliances to the feet of infants, their bulky form, inadequate mechanism and expensiveness; the discouragement of parents, the resistance of the patients to this treatment, etc. It will also be maintained, and with some show of reason, that good results have been secured by the use of tenotomy, forcible correction and the use of retention braces, and that this plan of treatment is extensively used by many prominent surgeons. While this is the case, it does not alter the fact that in the hands of surgeons generally, failure to cure the deformity in the manner stated, is of frequent occurrence. This is not to be attributed to lack of skill on the part of the surgeon using it, in my opinion, but to the defect of the method, chiefly, in not possessing the requirements for removing all the resistant conditions in the deformed foot by the first operative procedures employed.

Experience with the open plantar division shows that this can be accomplisht with ease and safety, and with no sacrifice of functional conditions in the foot, comparable with those which are delayed in their development or even lost, by the so-called conservative plan of treatment. In addition, the use of tedious, burdensome mechanical appliances inseparable from the latter method may be wholly discarded. In their place, measures may be directed to the development of the limbs on physiological lines, which place them nearly on a par with the limbs of the normal child when the age for walking has been reacht.

The method of treatment for infantile club foot which in the best manner embodies these advantages over the older forms, is that which was first suggested and practist by the late Dr. A. M. Phelps, of New York. Originally, it was employed for the correction of the more severe forms of the distortion, and for a number of years after its introduction was used largely for this class of cases. Of recent years its range of application has widened greatly, and at the present time it is employed by surgeons for the correction of all grades of resistant club foot. In the opinion of the writer it may appropriately be used for the treatment of the resistant infantile club foot of any degree for which the employment of tenotomy would be indicated—anticipating by an open division the further contraction of those muscles which cause the rapid increase of the deformity after birth, and offer the chief opposition to correction. Of late I have made use of this operation as a mode of treatment for infantile club foot at as early an age as I have been able to treat the patient. As yet I have been unable to employ it during the three or four weeks immediately after birth, when we do not hesitate to perform a tenotomy. But in place of the latter, I should now consider that such cases were receiving better treatment by having Phelps's operation performed. The disturbance of the patient is no greater in one case than the other, the main difficulty being only the need of greater care in applying the aseptic dressing.

The technic of this operation is undoubtedly familiar to all surgeons, so that reference to it in detail is not necessary in this place. Phelps insisted that all resisting structures should be divided until the foot could be brought into proper position. In the higher grades of deformity, this includes everything on the inner and plantar aspect of the foot, involving both tibials, the long flexors, the short flexor, and abductor hallucis, the accessorius, long plantar ligament, and even the ligaments binding together the tarsal bones. The internal plantar vessels and nerve

may be divided, but it is desirable not to go beyond the limit of the external plantar vessels and nerve, as this would serve no good purpose as far as removing resistance is concerned, and might endanger the vitality of the anterior part of the foot. The adaptability of this operation to varying degrees of deformity is one of its most valuable qualities. In the milder grades, the division of tissues may be commensurate only with the amount of correction needed to secure good abduction of the foot.

Frequently this may be obtained by division of the plantar fascia, flexor brevis digitorum, abductor hallucis, and the long plantar ligament. The long flexors of the toes may be avoided until the short muscles and ligaments have been divided, after which, if still too short, they may be split and elongated. It is surprising, however, even after the complete division of all those tissues, how much good functionating work referable to them may eventually be recovered. My personal experience with this operation was at first limited to its use in the severer types of deformity, but as a radical operation I think it is best adapted to the mild and moderate grades, in which the bones have not suffered great alteration or displacement.

Of late years I have employed the Phelps operation altogether for the infantile forms, for which I had formerly used subcutaneous divisions followed by forcible stretchings and mechanical retention. By the newer plan I have been able to dispense with apparatus to secure the correction which the operation gives. The plaster-of-paris dressing used in immediate connection with the operation may, in some instances, need to be reapplied a second and even a third time. But as soon as the operation incision is firmly healed, it may be discarded, and the employment of daily passive movement and massage practist by the nurse or parent under the direction of the surgeon. This comprises the chief post-operative care which the case requires pending the restoration of posture.

When the age for walking approaches, the child is to be supported and encouraged to place the weight upon the foot as a stretching and functional exercise. In addition to these, and principally to overcome the inversion of the feet, which depends largely on the rotation of the tibiae, I have made use of an ordi-

Fig. 4. End-result in a case of severe, double congenital club-foot. Tenotomy, manual stretching and plaster of Paris retention dressing were used in early infancy; treatment was abandoned after a few months, and nothing further was done until child was 20 months old. Treatment at 20th month by Phelps's operation. No appliances were used in post-operative care of feet except elastic rotating dressing, (See Fig. 5). Patient was not seen for six months after he left the Children's Hospital. Returned early in 1902 with relapse of varus in moderate degree in right foot, for which division thru scar of primary operation was made. Resistance was found in the accessorius, which had not been divided, and in some fibers of the long plantar fascia.

nary rubber elastic band of requisite strength, one end of which is fastened opposite the little toe to an adhesive strap wound around the foot at the base of the toes, the other end being fastened to a patch of adhesive plaster on the outer condyle at the knee. (Fig. 5) The tension of this elastic band may be regulated in a way to counteract the tendency of the feet and legs to turn in. It also assists the weaker muscles to perform a better quality of abduction and flexion of the feet. As soon as the child is old enough to walk, the effort is made to hasten the acquirement of this function, as this, in connection with the manual treatment, contributes greatly to the permanency of the correction. Aside from having shoes made properly for such patients,

Fig. 5. Elastic traction dressing used to oppose inward rotation of tibia and foot. This also effects a moderate amount of flexion and abduction of the foot.

the foregoing briefly describes the routine plan of treatment required for the milder forms of club foot. The limbs of infants treated by this plan are sturdier than those of patients who have worn close-fitting apparatus during the same period; the feet are in better position to fall into normal position from the weight of the body, and the muscular control of movements of the limbs and feet are acquired more quickly than by any other mode of treatment that I know of.

It has occasionally happened that a partial relapse of the varus has followed the neglect to carry out the daily manipulation treatment after the operation. (Fig. 4) In such cases I have re-operated, dividing thru the mass of cicatricial tissue

Fig. 6. Deformity and end-result in relapst congenital club-foot treated when 3½ years old by Phelps's operation, manual stretching and massage. No mechanical appliances used in post-operative care of feet.

marking the site of the first operation. This tissue has never in my experience been the seat of the contraction, the latter always depending on some of the deeper muscles whose division was not deemed necessary at the time of the earlier operation. Such cases quickly recover the use of the feet, and require no after-treatment essentially different from that employed in the beginning.

The more advanced type of deformity, (Fig. 9) where neglect

A. B. C.

Fig. 7. Showing deformity and end-result from the Phelps operation. (See also Fig. 8).

Fig. 8. A and B show amount of deformity present. C shows end-result in relapst, congenital club-foot treated by the Phelps operation. Residual varus (in C) is due to altered shape and dislocation of tarsal bones.

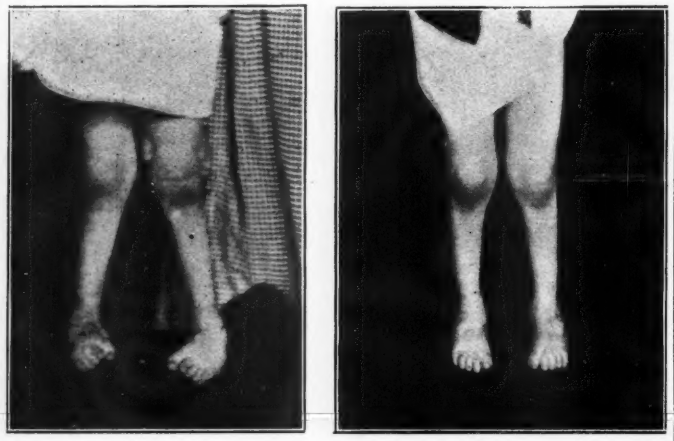
of proper treatment, or the entire absence of treatment has been a conspicuous feature thruout the life of the child, requires a more elaborate form of operative attention than that which has been outlined for the milder cases. Occasionally a satisfactory degree of correction may be secured in a case of severe deformity, by the procedure just described. (Figs. 6, 7, 8.) In such

A. B. C.

Fig. 9. Neglected congenital club-foot in child 10 years of age; no previous treatment employed. Treatment by the Phelps operation and (six weeks later) by cuneiform tarsal osteotomy. "B" shows varus remaining after the Phelps operation. "C" shows correction of the residual varus by cuneiform osteotomy; photograph taken 12 weeks after first operation.

instances, however, the division of resisting tissues must be very thoro to secure the large amount of abduction required. The dislocation of the tarsal bones, when severe, cannot be wholly overcome by the Phelps operation. (Fig. 8.) This condition offers so much resistance to the abduction of the foot, that, in addition to the division of the plantar tissues, it is necessary to remove a wedge of bone from the outer aspect of the tarsus (Prince's operation) sufficient to turn the anterior part of the foot outward and into better line. Cuneiform osteotomy, without interference with the muscles on the inner and plantar aspects of the foot, was suggested by Prince as a procedure for the correction of severe forms of club foot. It would appear, however, that this operation by itself still further shortens the foot and leaves the muscles on the inner side of the foot in a condition to undergo progressive shortening, which their greater strength enables them easily to do. In this class of cases, the employment of the Phelps operation as a preliminary measure, restores the length of the foot in a large degree, (Fig. 9b and Fig. 10a) and removes at the same time conditions which favor a relapse of the varus deformity. When recovery from this procedure has taken place, then a cuneiform osteotomy on the outer side of the tarsus may be done with great improvement to the condition and shape of the foot—better than may be obtained by either operation used alone. (Figs. 9, 10, 11.) The base of this wedge should be ample to afford large over-correction of the varus.

The advantage of combining these two recognized operations is at once apparent in the ease with which the varus deformity may be overcome, and the sole of the foot placed in a horizontal



A. B.

Fig. 10. Case of neglected congenital club-foot — child 5 years old; no previous treatment employed. Deformity of same degree as patient in Fig. 9. "A" shows varus deformity remaining after Phelps's operation. "B" shows correction of the varus deformity following cuneiform tarsal osteotomy six weeks after Phelps's operation. Photograph taken 12 weeks after first operation. (No photograph could be obtained of condition before operation.)

plane. As soon as union occurs in the divided tarsus (which requires about three weeks), the patient may begin to bear the weight on his foot. No protection in the form of brace or splint is required, as the foot having been adjusted to the axis of weight, and the conditions tending to cause relapse being removed, the functional use of the foot becomes the best protection against relapse.

One of the disadvantages of this combination method of treating the extreme forms of club foot, is the necessity for dividing the operative procedure into two stages. They could not, I think, be safely done at the same time without endangering the vitality of the anterior part of the foot, because of the extent of tissue requiring division.

Parents are often so well pleased with the correction obtained by the Phelps operation that they are disposed to be content with that alone, trusting to time and manipulations of the foot to obtain further improvement. This expectation is sometimes realized, which one case I particularly recall, goes to show. The plantar division having been done, the father of the child was entrusted with the passive movement and massage of the foot. His horror of the deformity and his ambition to have his child's feet straight stimulated his efforts to the extent of converting a mild residual varus into a severe valgus deformity, to correct which it was necessary to use a valgus foot plate.

In some instances of severe deformity the patients after plantar division have been treated by masseurs, and have derived much benefit from the methodical manipulation of the limbs and feet by skilled workers. This, while it is painful and may consume months of time, has rendered unnecessary the performance of a consecutive osteotomy. I mention these as roundabout ways of reaching the same end, but not to recommend in place of the combined operations.

With good technic, the safety of these operative plans of

Fig. 11. A relapst congenital club-foot—child six years old.

treatment, singly or combined, has everything to recommend them. In considerably more than a hundred open plantar divisions, I have never had sepsis as a complication, and the same may be said of tarsal osteotomy in the large number of instances where I have made use of it as a consecutive operation. The combination of open plantar division and cuneiform tarsal osteotomy, in the opinion of the writer, should displace excision of the astragalus (astragalectomy), which has been practist for the relief of inveterate and relapst deformities of this type during the period of childhood. It has the advantage of not further

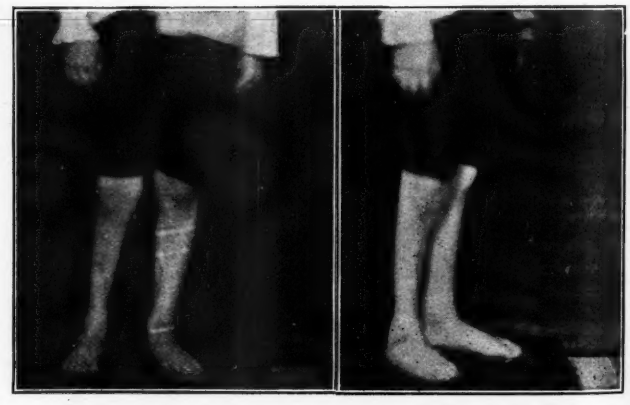


Fig. 12. Same case as Fig. 11—showing correction obtained by Phelps's operation and consecutive cuneiform tarsal osteotomy six weeks later. Photograph taken 12 weeks after first operation.

shortening the leg, which follows the removal of the astragalus. A greater advantage even is found in the non-interference with the ankle joint, which the combination procedure leaves practically intact. Provisional articulations soon form between the divided tarsal bones, and in due time the elastic conditions recovered in the arch are greatly increast in functional value by the preservation of a large measure of the function of the ankle joint.

THREE CASES OF TYPHOID SPINE.

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CASE I., H. T. Age 40, height 5 feet 8 inches, weight 188 pounds, a physician in active practice. During the latter week of August, 1900, the patient began to have pains, weakness and stiffness in the lumbar spines, or as usually described by patients, a severe backache. At first it was only noticeable in the morning of each day, but soon grew worse, until early in September his "nights and days became very troublesome to him," there being at the time night sweats, temperature 102½, heavily coated tongue, with more or less pain and weakness extending from lumbar region up to the cervical vertebrae. His appetite was fair, and he attended to his medical practice. By September 19th, the patient was feeling so badly that he called on Dr. G. M., of Cleveland, who, after going over his case thoroly, diagnosed his ailment as typho-malarial-fever, and prescribed accordingly. For some time the doctor improved, and by the latter part of September, or four weeks from the onset of the disease, the patient was nearly well, but at this time by an indiscretion of diet, consisting in the eating of oysters and solid food there was a mild relapse. Immediately following the relapse there was a markt increase in the spinal symptoms. The pain in the back was more to the right than the left, and extended down over the right sacro-iliac synchondrosis. The patient could not sleep for more than two or three hours at a time, and on waking would find himself "in a most crampt condition." He could not raise his head from the pillow, or turn over, or get out of bed without help, and also found himself sweating profusely. After moving about a little, he became quite limber, i. e., the crampt or paralyzed condition of his muscles would disappear, so that he could handle himself and move about easily, then after resting for awhile, the patient would go to sleep again, only to sleep for a short while, awakening to find himself in the condition just described. This continued till the nights became a horror to the doctor. During this time the patient was not confined to his bed, but lameness was quite apparent, so that he had to walk with a cane.

By October 7th, the patient found that his right shoulder was 1½ inch lower than his left, and the right hip apparently considerably larger than the left. Upon the advice of his physician, Dr. W. G. M., he called upon me.

At the time of his first visit I was unable to make a positive diagnosis, but informed the doctor that the diseases brought to mind were: typhoid spine, Pott's disease ,and sacro-iliac disease, but that the preponderence of symptoms was in favor of the first. At this time the patient had a spine that was absolutely rigid, with a deviation of the whole trunk, especially the upper part, to the left, with the right shoulder lower than the left, also right hip depresst, prominent and somewhat enlarged. The attitude assumed by the patient was identical to that assumed in sacro-iliac disease, but upon compressing the two iliac crests, there was no increase of pain in the sacro-iliac joint, this latter symptom being characteristic of sacro-iliac disease; and in addition, as against sacro-iliac disease was the age of the patient, for this disease is usually seen in young adults. As against Pott's disease, there was no evidence to kyphosis. Furthermore, tubercular disease of the spine or sacro-iliac joint, would be expected to produce greater depression in a patient of forty, not permitting him to go about as this patient was doing.

At this first visit a plaster jacket was applied as being beneficial either in typhoid spine or Pott's disease. After wearing this jacket for a week he returned, stating that the jacket was uncomfortable, especially at night, so that the jacket was cut open and turned into a corset removable at the convenience of the patient, and thereafter it was worn day-times only, being removed at night. At this time the use of crutches was advised. For a time the patient continued in about the same condition, accompanied by considerable emaciation. A little later a hacking cough was noticed with a temperature of 100 to 103, accompanied by profuse perspiration when asleep. Tilt of the body was very markt at this time, and there was quite a great deal of pain in and about the location of the sacro-iliac joint, especially when there was the least pressure brought upon the limb or when it was moved.

On October 27th, the doctor, feeling that he would like further advice regarding his case, called on Dr. X. of Cleveland, who diagnosed his ailment as "sacro-iliac disease, and tubercular in character." He advised that the doctor go to a hospital and to bed at once, at the same time that a plaster spica, from axilla to knee be applied, the patient there to remain for six or eight weeks, and thus prevent, if possible, an operation. The consultant at this time expresst a belief that there was then pus in the sacro-iliac joint. The patient believing that he could not endure this confinement for so long a time, as he could not lie down or remain in one position more than two or three hours at a time without a "dreadfully rigid and painful condition of the spine and hips occurring," and being terribly discouraged as to the outcome of his condition, for the mortality in sacro-iliac disease is exceedingly high, he again consulted me, informing me as to the advice he had received.

I assured the doctor that I was unable to confirm the diagnosis of sacro-iliac disease, and advised against the bed treatment and the plaster spica, at this time, believing that the confinement would be detrimental. I further advised the constant use of crutches, thus taking off all pressure from the right limb by keeping the foot from the floor, and that the patient should not exert himself in any way more than necessary. If this did not afford relief to the pain in the hip, we were to apply a Thomas's hip brace. The patient returned to his home and followed out my instructions as closely as possible. He had some relief from treatment, but not being entirely satisfied with his progress, and being disturbed in mind and body, he called in consultation another surgeon of Cleveland, who, after an examination, was unwilling to make a positive diagnosis, but thought that the patient had spinal curvature, but not sacro-iliac disease, and advised that my method of treatment be continued.

Two of the local physicians, professional associates of the patient, had different opinions regarding the nature of the doctor's ailment, one believing that the trouble to be largely gout and not tubercular, the other that "the filaments of the cord were effected, and that a stretching process might be beneficial."

From this on he gradually improved, but continued to have some fever until in January. The gradual improvement in the spinal symptoms confirmed my original belief that the ailment from which the patient suffered was typhoid spine, so that early in 1901 I was able to make a positive diagnosis.

By April, 1901, the patient had improved so much that he was able to leave off the plaster jacket, and by July, when he was again seen, he was on a fair road to recovery. In October the doctor visited the Pan-American Exposition, but found that the extra exertion of getting around the grounds brought on pains in the spine, so that he cut short his visit, returning home. By the latter part of November, 1901, just one year from the time when the symptoms were at their worst, the doctor felt that he had entirely recovered.

The medicinal remedies used in this case, which were largely a matter of the choice of the patient himself, consisted in the use of proto-iodide, of mercury, gelsemium, sulphate of lime, rhus toxicodendron; also the use of hot water applications and electricity. I examined the patient in the early part of 1902, and found his spine perfectly supple, his shoulders perfectly square, his hips of the same size, and there was every evidence to show that the patient had made a perfect recovery.

CASE II., J. E. H., male, age 25, with a history of previous good health, and engaged in running a milk wagon. Beginning in July, 1898, the patient had a protracted siege of typhoid fever, being attended by Dr. S., a physician of large experience. The family doctor stated that the man was slow in recovering, and did no work until late in the fall. In November, 1898, the patient stoopt over to pick up a bag of grain, when he fell to the floor, and was unable to walk for some minutes, and had to be helpt to his home. From that time on he had much pain and tenderness in the spine. About March 1st, 1899, the patient drove a milk wagon for three or four days, but was obliged to give it up. Lately he had been having a rise of temperature, but this rise had not been permanent.

March 17th, 1899, the writer was called in consultation by the family physician, and the following notes were made: "Temperature 99.2 F., spine is quite stiff. There is a slight general prominence of the 6th, 7th and 8th dorsal vertebra, and also of the 1st, 2d and 3d lumbar. In picking up objects from the floor the posture seen in Pott's disease is assumed, due to the rigid spine. No lateral motion is permitted. No pain from striking heels or from the jar of walking. Diagnosis,—Typhoid Spine."

"March 27th. Patient has been in bed some weeks, and gets up to have jacket applied.

"April 5th. Patient has been up and about since jacket was applied, and has gained so much flesh that the jacket had to be cut down in front and changed to a corset. Patient very much improved."

Notes of the case show that the rigidity in the spine contin-

ued for some months longer. The patient was seen a year and a half later, and had apparently perfectly recovered.

October 1st, 1902, the patient was examined and was found to be quite rugged, being heavier, as stated by the patient, than he had ever been before. He runs a milk wagon, his former business, and on manipulation, I found his spine in a normal condition.

CASE III. The third case of typhoid spine, which I desire to report, I had the privilege of seeing thru the courtesy of Dr. C. J. Aldrich, of Cleveland, who intends making a more detailed report at a later date.

"E. B., male, white, railway brakeman, suffered typhoid fever in October, 1900. It was a severe attack, twelve weeks of which he was out of his head, and suffered greatly from diarrhea and hemorrhage, and later from two bad bed sores, one over the left hip and the other over the sacrum. Soon after, being able to be about, he began to experience pain in the distribution of the last left dorsal nerve. Later this pain extended to the opposite side, and he became very emotional, suffering great pain, slight fever, and attacks of spasmodic retraction of the left testicle into the ring, which was so severe as to necessitate the use of morphine. The skin on his legs was blue in color and cold to touch. The right knee jerk was plus, left double plus, no ankle clonus, no loss of sensation in the lower limbs. There was a hyperesthetic band in the distribution of the dorsal nerves. The spine was very rigid, and excessively tender under the eleventh and twelfth dorsal spines. The sphincters were unaffected. The abdominal and thoracic contents appeared to be normal.

This patient was kept in bed for a period of nearly two months, was treated with tonics and light massage to the limbs, and finally made a good recovery, which occupied, however, nearly one year."

A POINT IN THE DIAGNOSIS OF TUBERCULAR BONE AND JOINT LESIONS IN CHILDREN BY MEANS OF THE RADIOGRAM.

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The advent and development of radiography have furnisht us with one more means of making or confirming the diagnosis of tubercular bone and joint lesions. As yet the technic of radiography has not advanced to a point where the diagnosis should be based on the results of the examination by this means alone. Especially misleading may one single radiogram prove in a case of tubercular lesion of the soft joint structures. If here the penetration of the rays be so high as to allow only the bony structures to appear on the radiogram the soft structures and an incipient lesion within them may not appear. Error from this source may be excluded by making a series of radiograms, on which the soft parts are made to show by penetration of the rays being diminisht. This can be done in one sitting by exposing a number of plates at the same time—one placed under the other. This process is somewhat expensive and circumstantial, and its results are not absolutely trustworthy. The physician can therefore not be excused from establishing the diagnosis of tubercular joint lesion in the well known usual way, upon which I need not enlarge here. Even tho the lesion be situated, however, in the bone and ought therefore to show on the radiogram, error is not excluded. To be sure the radiogram represents conditions as they are, but the interpretation of the radiogram is quite as important as the technic of making it. The following case will serve as an illustration of one point to be remembered in interpreting the radiogram with regard to the possible presence of a bone or joint lesion in children in whom the ossification is incomplete.

The patient, a girl ten years old, was referred to me by the family physician. She had been advised by him to see me fully six months previous to her first visit to me for an affliction of the shoulder joint; but the symptoms at the time of this advice were so little markt that the counsel of the family physician was not heeded and the visit to me deferred. In the meantime, as no treatment had been had, the condition grew rapidly worse, so that when I saw the patient first the general as well as local symptoms, together with the family and personal history, allowed the diagnosis of tuberculosis of the joint to be made with little chance of error. Partly in order to confirm the diagnosis, partly in order to localize the lesion, a radiogram was made by

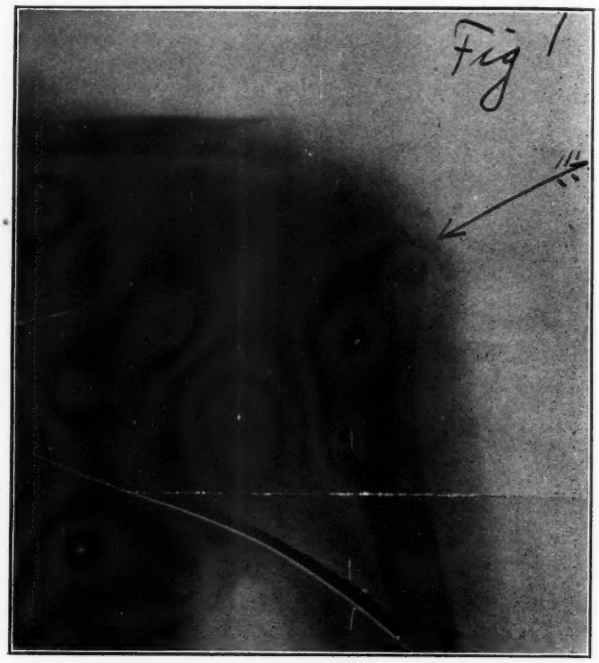

Fig. 1. Radiograph—not satisfactory.

Dr. Sprenger. (Fig. 1.) On this the articular surface is not well brought out, and its condition could not be judged of by the radiogram. The greater tuberosity, however, is very translucent as compared to the rest of the epiphysis. The question arose: is the translucency due to the destruction of the bone? Gray states

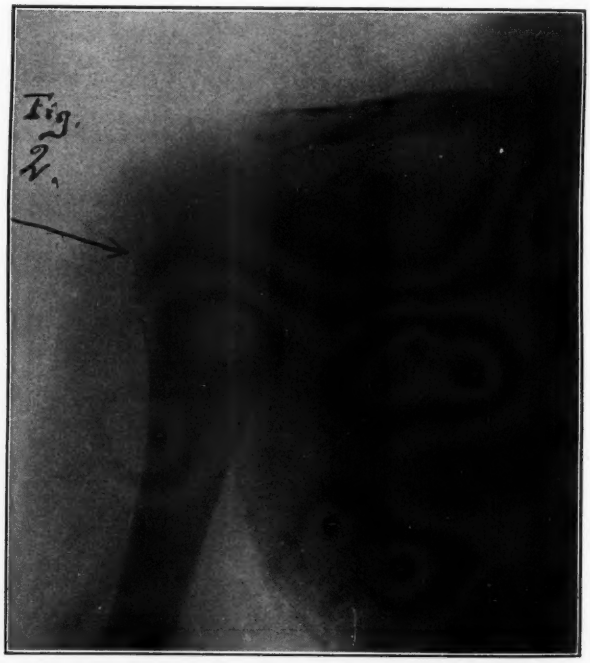

Fig. 2. Radiograph showing condition of ossification of sound arm.

that "by the fifth year the centres for the head and the tuberosities have enlarged and become joined, so as to form a single large epiphysis." The patient being ten years old, no difference between the density of the head and the tuberosities should have been expected. But the radiogram shows a well markt differ-

ence. Keeping in mind the possibility of belated ossification, a radiogram of the other humerus was made. (Fig. 2.) This shows the tuberosities to be less ossified than the head, but no such degree of difference as exists in the other arm is present. The lesser ossification in the afflicted arm must have, therefore, some other reason for existence than belated ossification.

Treatment was instituted and in order to control its efficiency another radiogram was made a little while later. (Fig. 3.) This shows the progress the disease had made, meanwhile, very clearly. The joint surface of the humerus is no longer clean-cut but ragged; it is no doubt the seat of the lesion in this case. The translucency of the tuberosities has increast so that they are hardly noticeable. There must then be atrophy of the bone in this location. The atrophy is very likely secondary and induced by the lesion in the joint disturbing the trophic changes in the bone. That the atrophy should confine itself in the particular stage represented here to the peculiar and circumscribed location may be explained by the incomplete process of ossification furnishing a point of decreast resistance.

Fig. 3. Radiograph showing advanced disease—well markt.

A series of cases would decide the point whether this is the rule in such cases or is simply accidental.

For purposes of diagnosis this case seems to point this moral: In trying to establish or confirm the diagnosis or determining the location of bone lesions characterized by atrophy of the bony mass in individuals in whom ossification is not complete by means of the radiogram, a control picture of the unaffected side should be made to avoid the error of mistaking incomplete ossification for atrophy.

LACERATION OF SUBCLAVIAN BY FRACTURED BONE.

Dr. Wm. E. Butler, of Brooklyn, reports to Brooklyn Medical Journal, February, 1903, a fatal laceration of the subclavian artery by the fragments of a fractured clavicle. Ligation of the vessel was attempted but the patient died on the table, altho the amount of blood which had been forced into the neighboring tissues did not exceed two quarts.

DIRECT TRANSPLANTATION OF MUSCLES IN THE TREATMENT OF PARALYTIC DEFORMITIES.

BY J. W. COKENOWER, M. D., DES MOINES, IOWA,
Professor of Orthopedic Surgery in the Iowa College of Physicians and Surgeons.

It is not the purpose of this paper to go into the etiology or pathology of paralysis but it should be understood that which confronts the general practitioner as well as the orthopedic specialist most frequently is paralysis from acute anterior poliomyelitis (or infantile paralysis), which occurs most frequently during the child's first dentition or between six months and two years, altho many typical cases occur later. It is a well known fact that children during dentition are especially irritable and liable to neuroses of all sorts and that this condition of exalted nervous irritability is sufficient to render the spinal cord most susceptible to any irritation that would produce paralysis. This form, as well as that from paralysis, occurs more frequently in the extremities, especially the lower limbs, thus impairing locomotion. It is the purpose of this paper to present a plan whereby locomotion may be benefited when all other means fail.

It is fortunate that all the muscles are not always paralyzed in a limb and when careful examination is made with the musculometer and manipulation, it is not difficult to learn what muscles are contractured, paralyzed or atrophied; after which it is easy to decide what to do.

The fact that tendons of non-paralyzed muscles can be attacht to the tendons of those which are paralyzed with a markt improvement in the usefulness of the part, as well as correcting or diminishing existing deformities, has been definitely proven during the last few years by quite a number of the leading orthopedic surgeons of both continents. Until a few years ago these operations had been confined entirely to the reattachment of muscles which had distinct and well formed tendons, but as the results in these cases were so gratifying, it was natural to try the same principle in other parts in which the mechanical conditions were similar, altho the anatomical structures were unlike.

It was found in a large number of cases of anterior poliomyelitis, or infantile paralysis, in which the thighs were involved, that the sartorius and the tensor vagina femoris frequently escaped the otherwise general paralysis. The latter because of its small size and the limited range of its contractility is of comparatively little importance, either in producing, or for use in correcting deformities. The former, however, is different. Naturally a strong muscle, with its spiral position, and the fact that between its distal and proximal attachments are two large joints, it is evident that if not outwardly antagonized, it can produce undesirable results. The outward rotation of the leg, together with the flinging gait so often seen in infantile paralysis, is largely the result of the action of this muscle. When the other muscles of the thigh are present, the sartorius by its contraction gives flexion, abduction and outward rotation of the thigh, and also to a limited degree, extension of the knee. However, when the muscles are affected as they are in poliomyelitis, the mechanical conditions change, the quadriceps extensor, instead of being an inch or more thick, become so much smaller that it is represented merely by thin fascia. The sartorius, as a result of this, practically rests upon the femur, and in changing its position, it not only sinks down against the bone, but as a result it crosses the femur nearer the upper part of the thigh than is normal. In the new position, together with the absence of muscles which normally antagonize it, the sartorious by its contraction causes an increase in the normal amount of flexion, abduction and outward rotation of the thigh and at the knee, instead of causing extension it becomes a flexor.

Tendon transference is of value for the purpose of preventing the dropping of the front of the foot, or where the anterior group of muscles have been weakened (whether the extensor proprius pollicis, anterior tibial, or the peroneus tertius are unparalyzed), they can be transferred to either side and in that way give power for the raising of the front of the foot, and the same plan may be utilized in the other muscles of other parts of the deformity. In many of the older cases of this affection distortion develops from the adapted shortening of the soft tissue and talipes valgus (or varus) deformities are establisht, induced at first by the inequality of the strength of the muscles and aggravated by the abnormal strain brought upon the various portions of the bones. This is equally true of the deformities occurring in other parts of the body as well as in club-foot, and the same principle in surgical mechanics that improves one will benefit the other.

To further illustrate, if the peroneal muscles on the outside

of the leg were paralyzed, it would produce a contraction and evert or turn the toes out and make talipes valgus, or if the tibialis anticus and posticus were paralyzed, it would invert or turn the toes in and make talipes varus, or if the anterior muscles of the leg and foot were involved, the result would be talipes calcaneus, or if the posterior ones, talipes enquinus, and so on with all other deformities, the same muscular, mechanical principle will be involved, producing results accordingly.

The leading orthopedic surgeons of both continents have given this subject special attention in the past few years and report many successful and interesting cases operated upon with gratifying results.

However, there are some cases in which no remaining nonparalyzed muscles exist. Such cases are not operable. For instance, the following will illustrate: A boy, aged 6, with nearly complete infantile paralysis of left leg and thigh appeared at my clinic in 1900. There were no contractions and very little movement of toes or knee. The glutei, the tensor vagina muscles and a portion of the abductor, retained some strength, but the quadriceps femoris and the controlling muscles of the foot were paralyzed. The case was one demanding mechanical treatment and an apparatus was furnisht which enabled him to use the limb and it developt almost equal to its fellow, but he is unable yet to get along without the support.

I have operated upon five cases. Three were a decided success and results satisfactory, while the other two, in a measure, were a disappointment, the failure, I think, being due to imperfect attaching of the muscles, but with past knowledge and a greater experience, such failures, or in fact, any failures, should not be due to imperfect technic. I will report but one case of those I have operated upon, because the same plan and principle were involved in the others with some difference in results. Miss B., aged 20, had paralysis of right leg since a child and was compelled to use crutches. I operated upon her by transferring the sartorius muscle to the tendon of the rectus femoris. After convalesence she could extend her leg while sitting and stand on the lame leg without support, and the flinging, flail gait, previously used, has been obviated and the leg is now extended normally when the step is taken and no brace or crutches needed.

The success this operation has achieved in the past few years is only the beginning of the end which will aid in relieving the serious deformities of anterior poliomyelitis or infantile paralysis that otherwise would result in confirmed cripples.

WEAK FOOT IN NURSES.

BY J. CLARK STEWART, M. D., MINNEAPOLIS, MINN.,
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Anyone taking an interest in orthopedics cannot help being struck by the prevalence of painful feet among trained nurses, especially among those who are still in the training school. This is not surprising, as the work of the pupil nurse is a severe test on the physical strength, and the long hours and constantly erect posture tell especially on the feet. Girls unused to severe physical exercise are given ten hours a day of pretty hard work, which almost invariably keeps them constantly on their feet, and soon results in bringing to notice any latent weakness in these humble members. Altho some training schools prescribe a sensibly shaped shoe for nurses' wear, such rules are often neglected, and too often former use of bad shoes and faulty habits of gait prepared the way for a rapid break down when the foot is subjected to the constant strain of the nurse's life.

The first sign of trouble is pain in the afternoon or sometimes not until the shoe is taken off at night, this pain being located at the inner side of the arch of the foot, or just below the external malleolus and running up the leg to the knee or even into the thigh. This pain usually affects one foot at first, but soon attacks both, altho one is regularly the seat of more distress. Soon the pain becomes fairly constant and in attempting to relieve it the girl adopts a clumsy wooden gait, "clumping about as if her feet were wood," as a hospital superintendent described it; and at this time walking upon the naked feet will be extremely painful and sometimes impossible. Such pains are quite regularly ascribed to rheumatism by the laity and by many physicians, and it is a lamentable fact that the orthopedist rarely sees a flat foot of any type which has not been treated for "rheumatism" at some time in its history.

An examination of the feet at this time will show no deformity, but passive inversion and eversion are generally painful and in bad cases impossible to any great extent. The only points brought out by examination, aside from this pain on passive movement, are that the tendons of the peronei muscles will be found tense and prominent and the foot will be adducted and slightly everted, and that when the weight is borne upon the foot the latter will be turned out and a line drawn along the crest of the tibia will fall far to the inside of the great toe. This is the essential fault in these cases, pronation of the foot, with the consequent shifting of the body weight to the inside with rotation of the astragalus and strain on the ligaments at the inner side of the arch of the foot.

Such cases if neglected will ultimately become confirmed flat feet, tho when first seen very few have any deformity of the arch, but merely, as noted above, pronation with sometimes a slight convexity at the inner line of foot where there should be normally a concavity. The regular course of such feet is that they get into a condition of spasmodic rigidity which makes locomotion almost impossible and later when this has subsided they gradually pass into more or less extreme flat foot with typical deformity.

Fortunately a large percentage of these cases can be arrested in their incipiency by simple measures and their owners can do a great deal of work without recurrence of the trouble if they are careful to observe hygienic precautions. An immense amount of comfort can be given in these cases by simple means and without apparatus and many girls can be helpt to finish their course and become efficient nurses who without this help would have to give up any work which kept them on their feet.

The first measure is of prevention. All nurses should be obliged to wear sensible "man fashion" shoes with broad soles and low heels, but such shoes should not be loose. The sole should take the foot with the body weight upon it without lateral compression and should be long enough to give the toes freedom, while the upper should be snug from the instep upwards and lace tightly enough to prevent sliding of the foot either forward or laterally. It is interesting to note how at variance with this standard are the ideas of many of the older nurses who have become hospital superintendents. They have been fortunate in having strong feet and have succeeded in getting thru their training in spite of most deplorably bad shoes, and this experience has given them a strong personal bias which is most difficult to overcome. The most erroneous idea among them seems to be that the moccasin is the ideal to be aimed at and that thin-soled, soft shoes give the greatest ease. Then the question of noise demands consideration and this is difficult to obviate in shoes such as are suitable for weakened feet. Still, by making the outer sole of felt, and using rubber heels a practically noiseless shoe can be attained. Japanese felt sandals are perfection for nurses' sick room use, but cannot be worn comfortably by anyone with weak foot of any type, and require specially constructed hosiery.

The superintendent of nurses should study the gait and posture of pupil nurses and when she notices markt "toeing out" either when walking or standing, she should inquire into such cases and ensure that such posture does not indicate pronation and consequent weakness. Cold bathing, massage and gymnastics can do a great deal of good before weakness has shown itself by pain, and should be a routine exaction.

When the foot has become painful and an examination shows the conditions noted above, as a rule prompt relief can be given by a proper shoe raised along the inner edge from one-quarter (¼) to three-eighths (⅜) of an inch, but such a shoe must have a broad sole and be tight enough to support the foot, or the outer side of the foot will suffer severely. In raising the sole it is best to fill up the shank of the shoe solidly, carrying the elevation across the whole inner edge of the shoe. Such a built-up shoe while clumsy in appearance, is not conspicuous when on the foot, and will do wonders for the comfort of its wearer. In addition the foot should be bathed nightly with hot water, showered with cold and then massaged and manipulated thoroly, especial care being given to thoroly inversion of the foot. It is also useful to have the patient stand on the bare foot with inner edges together and raise herself on her toes, say twenty to thirty times before retiring.

After the foot has reacht the spasmodic stage the condition will demand more radical treatment. Such feet must be overcorrected under general anesthesia and put up in plaster-of-paris in this overcorrected position for several weeks and then subjected to passive movement, massage, etc., as advised for the earlier cases. Some of these more severe cases will do well later with the inclined shoe, but more will require a supporting footplate, either the Whitman or some other, fitted to the corrected foot, which not only supports the foot, but also prevents a return of the deformity.

Many cases after correction can be made perfectly comfort-

able and enabled to get about in an ordinary shoe by adhesive plaster strapping after the method of Gibney, and some may be so relieved by this support that they can, after a few weeks, wear an inclined shoe, while others more severe will still have to finally use the rigid foot-plate. When a nurse has feet which demand such support it is only humane to advise her that some other occupation will be more conducive to the comfort of herself and patients; for only an angelic disposition can endure the constant work upon such feet and preserve the urbanity and interest in her patients demanded of the successful trained nurse.

OPERATION FOR PRIMARY TUBERCULOSIS OF THE VERTEBRAL ARCHES AND PROCESSES.

BY JOSEPH RILUS EASTMAN, M. D., INDIANAPOLIS, IND.,
Professor of Surgery in Central College of Physicians and Surgeons.

Albert of Vienna in his volume on the diagnosis of surgical diseases states that tubercular spondylitis pursues in adults a characteristic course. The symptoms are quite unlike those of Pott's disease in children. Whereas the gibbus develops within a few months after the onset in children, years not infrequently elapse before the deformity becomes discoverable in adults, and in many cases the angular deformity does not appear at all. Among the striking symptoms in the adult are the stiff carriage of the spinal column and tenderness over the spinous processes and pain upon jarring, as in riding over a rough road. In adults the disease develops much more insidiously than in children, and the diagnosis is therefore somewhat more difficult; nevertheless it must be said that even in the beginning there are few diseases with which tubercular disease of the spine in adults should be confused.

In the so-called "spinal irritation" there may be present distinct tenderness of one or more vertebrae and movements of the spinal column may occasion pain. Such symptoms may be pronounced in nervous, hysterical individuals. Here the slightest pressure upon the spinous processes seems to produce great pain, whereas stronger pressure occasions less pain. The movements of the spinal column are not restricted and the symptoms are inconsistent with each other and variable. At the beginning, in adults, one might in making differential diagnosis be unable to distinguish between tubercular caries and sarcoma of the vertebrae. The decision in such an uncertainty will be based upon the fact that in sarcoma an early and prominent symptom is pain which does not abate under absolute rest and the most judicious treatmeut.

Neuralgic pain, girdle sensation and compression paralysis, may accompany pachymeningitis, myelitis, and tumors of the spinal cord, as well as tubercular disease of the vertebrae, but in the latter, pronounced deformity will have presented itself before the appearance of paralysis. Neuralgic pains should not be taken to be indicative of spondylitis unless accompanied by the peculiar stiffness of the spinal column which is so prominent a symptom of Pott's disease, preceding as it does, all other symptoms. As is well known, in tubercular caries of the spine, the disease most frequently begins as tubercular osteomyelitis, sometimes as a periostitis of the body of the vertebra, less often in the intervertebral cartilages and very rarely in the articulations or in the vertebral processes.

Feurer ("Anatomische Untersuchungen ueber Spondylitis." Archiv. fuer path. Anatomie, B. lxxxii, page 89.) says that the superficial form of tubercular spondylitis is more frequent in adults than in children, and that if the bodies of the vertebrae are not much affected no curvature is produced. The deep-seated osseous form is more common in children and gives rise at an early stage to posterior curvature of the spine. The transverse and spinous processes are not often affected primarily, but these structures may be readily tuberculized by extension of the disease from the periosteum or ligamentous structures.

The writer recently operated, in his service at the Indianapolis City Hospital upon a case of tubercular disease of the spine which presented quite clearly the symptoms of this disease which are peculiar to the adult. The case was that of a man twenty-two years of age who gave a negative history as to every hereditary predisposition. There had been neither tuberculosis nor lues in any branch of his family as far as he knew. In the mid-lumbar region of the vertebral column immediately to the left of the spinous processes were the openings of two sinuses. These had existed for about two years. Exploration of these sinuses with the probe made it plain that they led directly to the laminae of the vertebrae.

The man could not recall having sustained a traumatism of any kind which could be connected in an etiological way with his condition. The case was diagnosticated as tubercular disease of the spine, involving principally and perhaps solely the posterior portions of the vertebrae. Simple non-specific osteitis is practically unknown in this part of the spine, and osteomyelitis when it occurs in the vertebrae is acute and rapidly progressive. Malignant disease of the spine is usually productive of excruciating pain in the course of nerves.

Keeping in mind the local tenderness and the facts that the sinuses led down upon the laminae of the vertebrae and that no abscess or sinus opened anteriorly, that there was no angular deformity, that the man's capacity for work was not reduced in the slightest degree, as would certainly have been the case had the bodies been diseased, and that the patient was an adult, it seemed reasonable to suspect at least, that the case was one of so-called posterior vertebral disease. It was recalled that tubercular disease of the bodies of the vertebrae and intervertebral discs rarely causes deformity in the adult, and a positive diagnosis was therefore not made. It should be stated that tubercle bacilli were not found in the discharge from the sinuses before the operation, but this did not strongly militate against the assumption that the disease was tubercular for the reason that it is not infrequently observed that altho the walls of an abscess or sinus may harbor tubercle bacilli, these micro-organisms may not appear in the discharge.

An incision about four inches long was made parallel with the vertebral column and splitting the two sinuses. A drachm of thin pus escaped. The muscles were drawn aside and the lateral aspects of the spinous processes and the laminae of the second and third lumbar vertebrae were cleared, but not without some difficulty owing to the extensive scar formation about the old canals. The left lamina of the second lumbar vertebra was found to be carious and was curetted away with the small Volkmann's spoon, exposing the dura mater. A carious piece of bone about the size of a pea was removed from the side of the base of the spinous process of the same vertebra. There were also small carious foci in the corresponding lamina of the third lumbar vertebra. The tuberculized soft parts in the neighborhood of the diseased bone and the walls of the indolent old tracts were cut away with scissors and curet. The operation was a very easy one. It was ended without extending the dissection to the bodies of the vertebrae as the sinuses did not extend more deeply than the region of the laminae, nor was there any other indication that the vertebral bodies were diseased.

The wound was simply packt with iodoform gauze. No attempt was made to provide physiological rest by the application of a plaster-of-paris cast or other immobilization apparatus. Examination of the curetted material proved it to be tubercular.

Within a month the wound healed soundly and at this time, three months after the operation, there is no indication of return of the disease. In the so-called "posterior vertebral disease," that is in cases in which the tubercular foci are situated in the transverse, spinous processes or laminae, operation is (as Keen notes) both easy and satisfactory. In seven out of eight cases recorded previously to the author's, the operation gave excellent results. Posterior vertebral disease is, however, very rare.

LITERARY NOTES.

SAUNDERS' AMERICAN YEAR-BOOK.

The American Year-Book of Medicine and Surgery for 1903. A yearly Digest of Scientific Progress and Authoritative Opinions in all branches of Medicine and Surgery, drawn from journals, monographs, and text-books of the leading American and foreign authors and investigators. Arranged, with critical editorial comments, by eminent American specialists, under the editorial charge of George M. Gould, A. M., M. D. In two volumes—Volume I, including General Medicine, Octavo, 700 pages, fully illustrated. Philadelphia, New York, London: W. B. Saunders & Co., 1903. Per volume: Cloth, $3.00 net; Half Morocco, $3.75 net. There is no other similar publication, either American or foreign, that can compete in any way with this excellent Year-Book, publisht by W. B. Saunders & Company. It is not an indiscriminate collection of extracts clipt from any and every journal: the matter is carefully selected, edited and in numerous cases commented upon by the eminent authorities whom Dr. Gould has enlisted as his assistants. Every new theory and scientific discovery worthy of the consideration of the profession has found a place in this

unusually complete Year-Book; and the names of the several editors are sufficient guarantee of a proper discrimination. The work comes in the same dress as last year—in two volumes. Volume I contains General Medicine and Volume II General Surgery, the volumes being sold separately if desired. As usual, the illustrative feature is well taken care of, there being eleven full-page inserts, besides many excellent text-cuts. The surgical volume is strongly recommended to readers of the Journal, who desire a synopsis of all that represents progress during the past year.

INTERNATIONAL TEXT-BOOK OF SURGERY.

Volume II of this great addition to surgical literature is devoted to Regional Surgery. Surgery of the Mouth and Tongue is described by N. P. Dandridge, M. D., of Cincinnati, Professor of Surgery in Miami Medical College; of the Nose by H. Holbrook Curtis, M. D., Consulting Surgeon to the New York Nose and Throat Hospital; of the Neck, by A. Pearce Gould, F. R. C. S., Lecturer on Surgery in Middlesex Hospital Medical School; of the Esophagus, by John B. Deaver, M. D., Surgeon to the German Hospital, Philadelphia; of the Thorax, by John Murray, F. R. C. S., Assistant Surgeon to Middlesex Hospital; of the Breast, by J. Collins Warren, M. D., Professor of Surgery in Harvard Medical School, Boston; Peritonitis, by Robt. Abbe, M. D., Clinical Lecturer on Surgery, Columbia University, New York; Surgery of the Stomach and Intestines, by A. J. McCosh, M. D., Surgeon to the Presbyterian Hospital, New York; Appendicitis, by Chas. McBurney, M. D., Professor of Clinical Surgery College of Physicians and Surgeons of New York; Surgery of the Bile-tracts, by John W. Elliott, M. D., Boston, Surgeon to the Massachusetts Hospital; Hernia, by Wm. T. Bull, M. D., Professor of Surgery in College of Physicians and Surgeons of New York; Surgery of the Rectum, by George A. Peters, M. D., Professor of Surgery in the University of Toronto; Surgery of the Kidney, by the late Christian Fenger, M. D., Professor of Surgery in Rush Medical College, Chicago; Surgery of the Scrotum and Testicles, by H. Tuholske, M. D., Professor of Clinical Surgery in Washington University, St. Louis; Gynecological Surgery by F. Henrotin, M. D., Professor of Gynecology in the Chicago Polyclinic; Surgery of the Uterus, by L. S. McMurtry, M. D., Professor of Gynecology in the Louisville Hospital, College of Medicine; Syphilis, by E. W. Parker, M. R. C. S., Surgeon to East London Children's Hospital; Surgery of the Eye, by E. T. Collins, F. R. C. S., Surgeon to the Royal London Ophthalmic Hospital; Surgery of the Ear, by J. O. Green, M. D., Clinical Professor of Otology, Harvard Medical School, Boston; Surgery of the Skull, by Rudolph Matas, M. D., Professor of Surgery in Tulane University, New Orleans, and Traumatic Neuroses, by J. J. Putnam, M. D., Professor of Nervous Diseases, in Harvard Medical School. If the publishers (W. B. Saunders & Co., of Philadelphia and London) would bind some of these sections separately there would be an immense sale. The entire set will sell well, but there are a great many who cannot afford to purchase, yet who would like some of the contributions.

SAUNDERS' MEDICAL HAND-ATLASSES.

Atlas and Epitome of Traumatic Fractures and Dislocations. By Professor Dr. H. Helferich, Professor of Surgery at the Royal University, Greifswald, Prussia. Edited, with additions, by Joseph C. Bloodgood, M. D., Associate in Surgery, Johns Hopkins University, Baltimore. From the fifth revised and enlarged German edition. With 216 colored illustrations on 64 lithographic plates, 190 text-cuts, and 353 pages of text. Philadelphia and London: W. B. Saunders & Co., 1902. Cloth, $3.00 net. This worthy addition to Saunders' Series of Hand-Atlases will be found of great value in facilitating the student's introduction to the important department of fractures and dislocations, and as a ready reference book for the use of physicians in general practice. This department of medicine being one in which, from lack of practical knowledge, much harm can be done, and in which in recent years great importance has obtained, a book which accurately portrays the anatomic relations of the fractured parts, together with the diagnosis and treatment of the condition, has been needed. This book fairly well meets the requirements. The author has brought together in this work a collection of illustrations notable for accuracy and clearness of portrayal of the conditions represented, showing the visible external deformity, the X-ray shadow, the anatomic preparation, and the method of treatment. The book will be of great service, not to teachers and famous surgeons, but to students and to general practitioners who attend cases such as described in its pages.

ORTHOPEDIC NOTES.

NOISY SHOULDER.

At a meeting of the Orthopedic Section of the New York Academy of Medicine held November 21st, 1902, Dr. R. H. Sayre presented a patient affected by "noisy shoulder." There was slight curvature of the spine, but the interesting feature was that there was a crackling sound in the scapular region when the shoulder was moved up and down, with slight pain over the deltoid. There was an impression conveyed to the fingers as if the scapula were sliding over some substance. He could not account for the cause of the noise and was at a loss to explain the pathology. In the discussion Dr. Virgil P. Gibney said he regards such cases as hysterical—whether at the shoulder or knee; he usually prescribes the Paquelin cautery and long-continued rest. Dr. Royal Whitman was inclined to regard the noise as due a slipping tendon, or a snapping due to the presence of a bursa beneath the scapula. Dr. George Elliott related the history of a similar case in which he was certain the noise did not depend on a snapping tendon tho he had no explanation to offer as to any other cause.

RESULTS FROM THE HOFFA-LORENZ TREATMENT.

According to Dr. Royal Whitman, of New York, cases of congenital dislocation of the hip treated by the Hoffa-Lorenz method of reduction and fixation give one of three results: (1) Permanent replacement, with final results varying from practically perfect functional cure to anchylosis and deformity; (2) imperfect reposition, in cases of which there is often free motion, and the final result as usually somewhat better than after a simple transposition of the bloodless method; (3) failures; but he thinks it clear that after the open operation there is little excuse for complete failure. The statistics of the open operation (and to a far greater degree of the bloodless operation) suffer because of the improper performance of the operations and the improper selection of the cases. The author holds the following opinions: (1) That the more complete fixation which may be obtained by carrying the plaster bandage below the knee after reduction, (combined in certain instances with lessened outward rotation of the limb) is an improvement on the ordinary technic of the Lorenz operation in the treatment of young children; (2) that a longer period of fixation in an attitude approximating the normal is necessary to assure the remoulding of the acetabulum in older subjects; (3) that arthrotomy and osteotomy must be regarded as necessary supplements to conservative treatment; (4) that the original Hoffa-Lorenz operation offers a prospect of a better ultimate result than transposition and that the latter must therefore be held in reserve as a final resort after failure of the less radical treatment.

PERFECT CURE OF POTT'S DISEASE.

Archives of Pediatrics contains the history of a case of tuberculosis of the spine in which Dr. Homer Gibney, of New York, secured a perfect cure—i. e., cure without deformity. The child was three years of age when he began treatment, June, 1901. In the previous January, without known cause, the boy began to walk awkwardly, the abdomen being thrown forward and he swayed from side to side with evident pain. Nothing was noticeable but the above till June, when a swelling appeared in the left buttock which interfered with locomotion. He was treated at various hospitals and operated on at a downtown hospital, by aspiration—pus and blood being withdrawn. Examination showed a fairly well nourisht child with a nodular swelling on the left buttock posterior to the great trochanter, tense but not painful; he could not walk; the body was thrown forward, the abdomen prominent; in the effort to pick up a penny, he supported himself by hands on knees; the lumbar spine was rigid and there was a slight prominence at the fourth lumbar vertebra. On August 1st, a frame was applied and the grandmother was instructed in its care. December 20.—Doing well, very little deformity. Swelling on the left side had disappeared. January 11th, 1902.—Back in good condition, no deformity, fairly flexible. July 1st, 1902.—For two months has worn permanent jacket, which was applied and allowed to dry on the frame, thus getting complete fixation in over-corrected position. November 18th.—Left off the apparatus; spine flexible, no evidence of disease; discharged cured. The frame was the one used in dispensary and private practice, a modification of the Bradford frame, made of canvass over gas piping, easily bent from time to time, thus over-correcting the deformity.